

REMARKS

This application has been reviewed in light of the Office Action dated October 31, 2003. Claims 1-4 and 7-10 are pending in this application. Claims 1, 9, and 10, which are the independent claims, have been amended to define still more clearly what Applicant regards as his invention, in terms that distinguish over the art of record. Favorable reconsideration is requested.

The Office Action objected to Claims 1, 9, and 10 as to matters of form relating to the claim language. Applicant has adopted the Examiner's recommendation to clarify the claims, i.e., to recite that the connection electrode, the bump electrode, and the electrical wiring member are vertically overlapped, wherein the bump electrode is located between the connection electrode and the wiring member. Applicant therefore respectfully requests withdrawal of this objection.

The Office Action rejected Claims 1 and 7-10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,325,488 B1 (Beerling et al.) in view of U.S. Patent No. 6,188,414 B1 (Wong et al.), and rejected Claims 2-4 as being unpatentable over Beerling et al. in view of Wong et al. and U.S. Patent No. 5,796,416 (Silverbrook). Applicant respectfully traverses these rejections.

Applicant submits that amended independent Claims 1, 9, and 10, together with the remaining claims dependent thereon, are patentably distinct from the proposed combination of the cited prior art at least for the following reasons.

The aspect of the present invention set forth in Claim 1 is an ink jet recording head comprising a flat substrate having an end face and front and back flat main surfaces, where the front and back flat main surfaces have a larger area as compared to the end face. The recording head also includes a discharge port formed above the front flat

main surface of the substrate, a wiring electrode connected to an energy generating member formed on the front flat main surface of the substrate, where the energy generating member generates energy utilized to discharge ink from a discharge port, and a stepped surface provided at an end of the substrate and provided lower than the front flat main surface. A connection electrode of the recording head is electrically connected to the wiring electrode and provided on the stepped surface, and an electrical wiring member is superimposed on the connection electrode and electrically connected to the connection electrode through a bump electrode to supply an electrical signal or electrical power to the connection electrode. A sealing member electrically conductively seals and covers the connection electrode, the bump electrode, and the electrical wiring member on the stepped surface. The sealing member does not extend beyond the discharge port in such a manner that the connection electrode, the bump electrode and the electrical wiring member are vertically overlapped, with the bump electrode being located between the connection electrode and the electrical wiring member.

Among the notable features of Claim 1 are that the sealing member (see FIG. 1, reference numeral 70) electrically conductively seals and covers the connection electrode 50, the bump electrode 80, and the electrical wiring member 60 on the stepped surface, and the sealing member does not extend beyond the discharge port 40 in such a manner that the connection electrode 50, the bump electrode 80 and the electrical wiring member 60 are vertically overlapped. Since the top portion of the sealing member 70 does not project from the discharge port 40, the discharge port 40 may be located as close as possible to the recording medium to perform ink jet recording with high precision. (It is to be understood, of course, that the scope of Claim 1 is not limited to the details of this embodiment.)

Beerling et al., as understood by Applicant, relates to an ink jet printhead for wide area printing. The Office Action, at page 5, states (and Applicant agrees) that Beerling et al. does not teach or suggest a sealing member, including a sealing member that does not extend beyond the discharge port. The Office Action at page 4 states that Beerling et al. discloses a connection electrode and wiring member vertically overlapped, with the bump electrode provided between them, and the Examiner states that Figure 11 provides support for this assertion. Applicant notes that in Beerling et al., Figure 11 is discussed from column 9, line 65, to column 11, line 31. In particular, the specification from column 10, lines 53-61, discusses a conducting layer (1113), substrate (1101), a thick layer (1109), and a thin layer (1111). Nothing, however, has been found in this section, or any other section, of the specification that would teach or suggest the features of a connection electrode, bump electrode and electrical wiring member being vertically overlapped, where the bump electrode is located between the connection electrode and the electrical wiring member, as recited in Claim 1.

Wong et al., as understood by Applicant, relates to an inkjet printhead with a preformed substrate. Initially, Applicant submits that nothing has been stated in the Office Action, and nothing has been found in Wong et al., that would teach or suggest a connection electrode, bump electrode and electrical wiring member being vertically overlapped, where the bump electrode is located between the connection electrode and the electrical wiring member. The Examiner relies on Wong et al., as stated in the Office Action at page 5, for teaching an ink jet print head having a sealing member which covers the electrical connections and does not extend beyond the discharge port. The Examiner asserts that FIG. 5B of Wong et al. provides support for this assertion, and reference numeral 110 of FIG. 5B provides support for the sealing member in particular. Applicant

submits that FIG. 5B merely shows a wire 508 that conductively connects electrodes 211 and 510 arranged in a lateral direction, and nothing in FIG. 5B, or any other section or figure of Wong et al., would teach or suggest a sealing member that electrically conductively seals and covers the connection electrode, the bump electrode, and the electrical wiring member on the stepped surface, where each of these features are vertically overlapped.

Accordingly, Applicant submits that at least for the reasons discussed above, Claim 1 is patentable over the cited prior art, when taken separately or in any proposed combination.

Independent Claims 9 and 10 are apparatus and method claims, respectively, that correspond to the ink jet recording head of Claim 1, and are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

A review of the other art of record, including Silverbrook, has failed to reveal anything that, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as applied against the independent claims herein. Therefore, those claims are respectfully submitted to be patentable over the art of record.

The other rejected claims in this application depend from Claim 1 discussed above, and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and the allowance of the present application.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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